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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 10/589,990 | HAYAKAWA ET AL. |
| | Examiner | Art Unit |
| | MICHAEL FIALKOWSKI | 4173 |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --***

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on _18 August 2006_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) _1-16_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-16_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _18 August 2006_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _August 18 2006_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

### ***Claim Objections***

1. Claims 1,2,3,7,11,15 are objected to because of the following informalities:

Re claim 1, on line 6 of the second page, Applicant recites in part, “recognizing unit is other edge-packet transfer unit”. Examiner suggests adding "the" or modifying to "another" to read 'recognizing unit is another edge-packet transfer unit' to make grammatical sense.

Re claim 2, on line 26, page 2, Applicant recites in part, “recognizing unit is other first edge-packet transfer unit”. Examiner suggests adding "the" or modifying to "another" to read 'recognizing unit is another first edge-packet transfer unit' to make grammatical sense.

Re claim 3, on line 18, Applicant recites in part, “copies other packet corresponding”. Examiner suggests adding "the" or modifying to "another" to read ‘copies another packet corresponding' to make grammatical sense.

Re claim 7, on line 17, Applicant recites in part, “unit transmits the packet to other wavelength path if”. Examiner suggests adding "the" or modifying to "another" to read ‘unit transmits the packet to another wavelength path if' to make grammatical sense.

Re claim 11, on lines 12-13, Applicant recites in part, “copying, …, other packet corresponding”. Examiner suggests adding "the" or modifying to "another" to read ‘copying, …, another packet corresponding ' to make grammatical sense.

Re claim 15, on line 18, Applicant recites in part, “the packet to other wavelength path if”. Examiner suggests adding "the" or modifying to "another" to read ‘the packet to another wavelength path if’ to make grammatical sense.

Appropriate correction is required.

### ***35 USC § 101- Patentable Subject Matter***

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1- 8 disclose an invention of patentable subject matter involving a network for packet communication. Claims 9-16 disclose an invention of patentable subject matter involving a method of steps for performing the packet communication. Claims 1-8 disclose physical devices such as a WDM transmission unit, internal-packet transmitting unit, and external-packet transmitting unit. Claims 9-16 provide the method steps for the devices of 1-8. By providing a method and physical devices that implements the method in claims 1-16, the Applicant satisfied the requirements of 35 USC § 101.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-8, 9-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, Applicant recites in part starting on line 27, "the edge-packet transfer unit inputs a packet received from outside to the internal-packet", continuing on line 30, "transmitting/receiving unit to the outside. It is unclear what the "outside" is and therefore renders the claim and all dependent claims indefinite.

Re claim 6, Applicant recites in part on lines 7-8, “the interface connecting the edge-packet transfer unit;”. For the claim to point out the invention, the interface must connect one object to a second object. The interface, to connect, must connect the edge-packet transfer unit to another unit or object.

Re claim 9, Claim 9 recites the limitation "first packet" and “second packet” in line 23 and line 1,page 2, respectively. There is insufficient antecedent basis for this limitation in the claim and renders claim 9 and all dependent claims indefinite.

Re claim 10, Claim 9 recites the limitation "third packet” in line 12, page 2. There is insufficient antecedent basis for this limitation in the claim and renders claim 10 and all dependent claims indefinite.

### *Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1,2,9,10 are rejected under 35 U.S.C. 102(b) as being anticipated by Beshai et al (6,339,488).

Re claim 1, Beshai et al discloses a packet communication network comprising:

- at least two full-mesh wavelength-division-multiplexing transmission units (See Figure. 1, plurality of full-mesh nodes and Figure 27 for multiple optical nodes), each of which includes n number of interfaces, and is capable of establishing a bidirectional (bidirectional [5,65] - [6,2]) full-mesh communication between all of the interfaces using a wavelength path based on a wavelength-division-multiplexing technique (network comprises an optical core network having a number of optical nodes fully meshed by optical links [5,45-52], each link can be realized in a muli-wavelength optical circuit [5,55-60]) , where n is an integer equal to or greater than 3 (for example 7, See letters A-G in Figure 1);
- an edge-packet transfer unit (electronic edge switch [7,6-16]) that includes at least a packet recognizing unit , an external-packet transmitting/receiving unit (See labels 42 and 46 in Figure 2), and an internal-packet transmitting/receiving unit (See labels 50 and 52 in Figure 2), and is connected to the interface of the full-mesh wavelength-division-multiplexing transmission unit (See connection of 18, for example, to full mesh in Figure 1) ; and
- an internetwork connection unit (optical node) that includes at least a packet recognizing unit (recognizes destination [10,63-67]) and a packet transmitting/receiving unit, and connects the full-mesh wavelength-division-

multiplexing transmission units in a multistage tree-shaped structure through the edge-packet transfer units (electronic switches are divided into subnets and each global node may serve a subset [14, 35-45], See also Figure 27) , wherein

- the packet recognizing units of the edge-packet transfer unit and the internetwork connection unit identify the edge-packet transfer unit that is a destination of a packet from a header of the packet (at each node, external traffic is buffered into separate queues according to destination [10,63-67]),
- the external-packet transmitting/receiving unit of the edge-packet transfer unit inputs a packet received from outside (ingress port) to the internal-packet transmitting/receiving unit (core) , and transmits a packet output from the internal-packet transmitting/receiving unit to the outside (core to egress) (See Figure 2 and [7,6-16]),
- the internal-packet transmitting/receiving unit of the edge-packet transfer unit transmits the packet input from the external-packet transmitting/receiving unit to the wavelength path of the full-mesh wavelength-division-multiplexing transmission unit corresponding to the edge-packet transfer unit that is the destination of the packet identified by the packet recognizing unit (at each node, external traffic is buffered into separate queues according to destination [10,63-67]), if the destination of the packet identified by the packet recognizing unit is other edge-packet transfer unit connected to the full-mesh wavelength-division-multiplexing transmission unit, transmits the packet input from the external-packet transmitting/receiving unit to the wavelength path of the full-mesh

wavelength-division-multiplexing transmission unit corresponding to the other edge-packet transfer unit (each switch has a link matching the wavelength set used to access each optical node [12,50-60]), and if the destination of the packet identified by the packet recognizing unit is the edge-packet transfer unit of its own or the edge-packet transfer unit that is not connected to the full-mesh wavelength-division-multiplexing transmission unit, transmits the packet input from the external-packet transmitting/receiving unit to the external-packet transmitting/receiving unit, and the packet transmitting/receiving unit of the internetwork connection unit transmits the packet received from the edge-packet transfer unit to the edge-packet transfer unit that is the destination of the packet identified by the packet recognizing unit (Can transmit from external to core or core to external, See Figure 2 and [7,6-16]).

Re claim 2, Beshai et al discloses the packet communication network wherein

- the full-mesh wavelength-division-multiplexing transmission units include physically-independent plural full-mesh wavelength-division-multiplexing transmission units arranged in parallel (See Figure 26, for two different full-mesh transmission units (labeled 610 containing the rings in parallel),
- the edge-packet transfer unit includes
  a first edge-packet transfer unit (Figure 26, label 612 on top) connected to one of the full-mesh wavelength-division-multiplexing transmission units and the internetwork connection unit ((labeled 610 directly connected to 612, optical node

serves as an internetwork connection and full-mesh WDM transmission unit) ; and

a second edge-packet transfer unit connected to all of the full-mesh wavelength-division-multiplexing transmission units (Figure 26, label 612 (lower) electronic switch is connected to all WDM nodes),

- the internetwork connection unit (300 (top) in Figure 18) includes a switching unit (node 302) that is provided on an input side of the packet transmitting/receiving unit and switches over destinations of a plurality of packets received from a plurality of first edge-packet transfer units (304 in Figure 18) connected to the full-mesh wavelength-division-multiplexing transmission units (300 (top and bottom) , respectively, to determine a plurality of other first edge-packet transfer units connected to a plurality of other full-mesh wavelength-division-multiplexing transmission units that are the destinations of the packets (each switch has a one outgoing link to carry a channel matching the wavelength set used in the optical node [12,50-60]), and
- the internal-packet transmitting/receiving unit of the second edge-packet transfer unit ( Figure 18, non-labeled nodes similar to 304 on right side of figure) transmits the packet input from the external-packet transmitting/receiving unit simultaneously to same-wavelength paths of the full-mesh wavelength-division-multiplexing transmission units corresponding to the first edge-packet transfer unit or the second edge-packet transfer unit that is the destination of the packet identified by the packet recognizing unit (Can transmit from external to core or

core to external, See Figure 2 and [7,6-16]), if the destination of the packet identified by the packet recognizing unit is other first edge-packet transfer unit or second edge-packet transfer unit connected to the full-mesh wavelength division multiplexing units, transmits a plurality of packets input from the same-wavelength paths of the full-mesh wavelength-division-multiplexing transmission units simultaneously (See Figures 15 and 17) to the same-wavelength paths of the full-mesh wavelength division multiplexing units corresponding to the other first edge-packet transfer unit or second edge-packet transfer unit (each switch has a link matching the wavelength set used to access each optical node [12,50-60]), and if the destination of the packet identified by the packet recognizing unit is the second edge-packet transfer unit itself or first edge-packet transfer unit or second edge-packet transfer unit that is not connected to the full-mesh wavelength division multiplexing units, selects one of the packets, and transmits the selected packet to the external-packet transmitting/receiving unit (core to egress) (See Figure 2 and [7,6-16]).

Re claim 9, Beshai et al discloses a packet communication method using

- at least two full-mesh wavelength-division-multiplexing transmission units (See Figure. 1, plurality of full-mesh nodes and Figure 27 for multiple optical nodes), each of which includes n number of interfaces, and is capable of establishing a bidirectional (bidirectional [5,65] - [6,2]) full-mesh communication between all of the interfaces using a wavelength path based on a wavelength-division-multiplexing technique (network comprises an optical core network having a

number of optical nodes fully meshed by optical links [5,45-52], each link can be realized in a muli-wavelength optical circuit [5,55-60]), where n is an integer equal to or greater than 3 (for example 7, See letters A-G in Figure 1);

- an edge-packet transfer unit (electronic edge switch [7,6-16]) that includes at least a packet recognizing unit, an external-packet transmitting/receiving unit (See labels 42 and 46 in Figure 2), and an internal-packet transmitting/receiving unit (See labels 50 and 52 in Figure 2), and is connected to the interface of the full-mesh wavelength-division-multiplexing transmission unit (See connection of 18, for example, to full mesh in Figure 1); and an
- internetwork connection unit (optical node)that includes at least a packet recognizing unit (recognizes destination [10,63-67]) and a packet transmitting/receiving unit, and connects the full-mesh wavelength-division-multiplexing transmission units in a multistage tree-shaped structure through the edge-packet transfer units (electronic switches are divided into subnets and each global node may serve a subset [14, 35-45], See also Figure 27), the packet communication method comprising:
- first packet transmitting including
  the packet recognizing unit of the edge-packet transfer unit identifying the edge-packet transfer unit that is a destination of a packet with respect to a packet received by the external-packet transmitting/receiving unit (at each node, external traffic is buffered into separate queues according to destination [10,63-67]); and

the internal-packet transmitting/receiving unit of the edge-packet transfer unit transmitting the packet to the wavelength path of the full-mesh wavelength-division-multiplexing transmission unit corresponding to the destination of the packet (each switch has a link matching the wavelength set used to access each optical node [12,50-60]); and

- second packet transmitting including

  the packet recognizing unit of the edge-packet transfer unit on the other side of the wavelength path identifying the edge-packet transfer unit that is the destination of the packet received by the internal-packet transmitting/receiving unit (each switch has a link matching the wavelength set used to access each optical node [12,50-60]);

- the external-packet transmitting/receiving unit or the internal-packet transmitting/receiving unit corresponding to the destination of the packet transmitting the packet (at each node, external traffic is buffered into separate queues according to destination [10,63-67]), and when the external-packet transmitting/receiving unit is connected to the internetwork connection unit, the internetwork connection unit transmitting the packet to the edge-packet transfer unit corresponding to the destination of the packet (egress to egress or core to egress) (See Figure 2 and [7,6-16]); and

- repeating the first packet transmitting and the second packet

  transmitting until the packet is output from the edge-packet transfer unit

corresponding to the destination of the packet (control signals are sent to establish a path between a source node and destination [11, 1-10]).

Re claim 10, Beshai et al discloses the packet communication method wherein

- the full-mesh wavelength-division-multiplexing transmission units include physically-independent plural full-mesh wavelength-division-multiplexing transmission units arranged in parallel (See Figure 26, for two different full-mesh transmission units (labeled 610 containing the rings in parallel),
- the edge-packet transfer unit includes

  a first edge-packet transfer unit (Figure 26, label 612 on top) connected to one of the full-mesh wavelength-division-multiplexing transmission units and the internetwork connection unit ((labeled 610 directly connected to 612, optical node serves as an internetwork connection and full-mesh WDM transmission unit); and

  a second edge-packet transfer unit connected to all of the full-mesh wavelength-division-multiplexing transmission units(Figure 26, label 612 (lower) electronic switch is connected to all WDM nodes),
- the internetwork connection unit (300 (top) in Figure 18) includes a switching unit (node 302) that is provided on an input side of the packet transmitting/receiving unit and switches over destinations of a plurality of packets received from a plurality of first edge-packet transfer units (304 (all) in Figure 18) connected to the full-mesh wavelength-division-multiplexing transmission units (300 (top and

bottom), respectively, to determine a plurality of other first edge-packet transfer units connected to a plurality of other full-mesh wavelength-division-multiplexing transmission units that are the destinations of the packets (each switch has a one outgoing link to carry a channel matching the wavelength set used in the optical node [12,50-60]), and

- the packet communication method further comprises:

third packet transmitting including

the internal-packet transmitting/receiving unit of the second edge-packet transfer unit ( Figure 18, non-labeled nodes similar to 304 on right side of figure) transmitting the packet input from the external-packet transmitting/receiving unit simultaneously (See Figures 15 and 17) to same wavelength paths of the plurality of parallel full-mesh wavelength-division-multiplexing transmission units (each switch has a link matching the wavelength set used to access each optical node [12,50-60]);

- the internetwork connection unit selecting a packet to be transmitted by changing a communication configuration between the full-mesh wavelength-division-multiplexing transmission units according to the switching unit of the internetwork connection unit switching over paths from the first edge-packet transfer units to other first edge transfer units that are the destinations of the packet (Can transmit from external to core or core to external, See Figure 2 and [7,6-16]); and
- performing a redundant packet communication by the internal-packet transmitting/receiving unit of the second edge-packet transfer unit corresponding

to the destination of the packet selecting a packet received from the full-mesh wavelength-division-multiplexing transmission units and transmitting the selected packet (edge switches can multicast, an example of a redundant packet communication, to the remaining edge switches [15,7-25]).

### *Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 3-5, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beshai et al in view of Greenberg et al (6,970,451).

Re claim 3, Beshai et al discloses the packet communication network according to claim 2 as stated above, but does not explicitly disclose wherein the internetwork connection unit includes an important communication processing unit that extracts and compares important communication packets from the packets received from the first edge transfer units connected to the wavelength division multiplexing transmission units, respectively, and if there is a packet loss in one packet, copies other packet corresponding the one packet. However, Greenberg et al teaches of an important communication processing unit (unnamed) that extracts and compares important communication packets from the packets received from the first edge transfer units connected to the wavelength division multiplexing transmission units (nodes transmit relay and receive status information and commands and perform various diagnostics [7,36-50]) , respectively, and if there is a packet loss in one packet, copies other packet corresponding the one packet ( nodes correct errors , for example if a laser fails, a backup laser may be activated, and reroute information, thus a copy of the original packet [9, 10-27]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of wavelength division multiplexing in a network to copy a packet it there is a packet loss as taught by Greenberg et al in the network of Beshai et al in order to correct for packet loss.

Re claim 4. Beshai et al discloses the packet communication network according to claim 1, wherein the edge-packet transfer unit includes a packet recognizing unit that identifies the edge-packet transfer unit that is the destination of the packet (for example, edge switch takes traffic from ADM (optical node) and diverts it back to the core [6, 44-

50]) and and a service (QOS control [6,53-56]) from a header of the packet (inherently switched packets are switched based on a header, as opposed to the payload [10,63-67]); but does not explicitly disclose a packet processing unit that processes the packet received from the external-packet transmitting/receiving unit into a packet form for a communication method used by the full-mesh wavelength-division-multiplexing transmission unit if a communication method corresponding to the service identified by the packet recognizing unit differs from the communication method used by the full-mesh wavelength-division-multiplexing transmission unit, and processes the packet input from the full-mesh wavelength-division-multiplexing transmission unit to the internal-packet transmitting/receiving unit and output to the external-packet transmitting/receiving unit into the packet form for the communication method corresponding to the service identified by the packet recognizing unit if the communication method corresponding to the service differs from the communication method used by the full-mesh wavelength division multiplexing unit. However, Greenberg et al teaches of a packet processing unit (OEC, Optical/electrical interface [10,7-17]) that processes the packet received from the external-packet transmitting/receiving unit (IP router [10,7-17]) into a packet form for a communication method used by the full-mesh wavelength-division-multiplexing transmission unit if a communication method corresponding to the service identified by the packet recognizing unit differs from the communication method used by the full-mesh wavelength-division-multiplexing transmission unit (receives electrical signals from the IP router and converts the signals to optical form [10,47-55]), and processes the packet

input from the full-mesh wavelength-division-multiplexing transmission unit (MDM – multiplexer / demultiplexer [10,7-17], which for example can include WDM signals [10,56-62]) to the internal-packet transmitting/receiving unit and output to the external-packet transmitting/receiving unit (IP router) into the packet form for the communication method (electrical signal) corresponding to the service identified by the packet recognizing unit (IP router can determine if a message relates to the IP protocol [10,63-67]) if the communication method corresponding to the service differs from the communication method used by the full-mesh wavelength division multiplexing unit (converts optical signal to an electrical form [10,47-55]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of wavelength division multiplexing in a network to include a packet processing unit as taught by Greenberg et al in the network of Beshai et al in order to transfer packets from one type of communication method to another communication method.

Re claim 5, note that Beshai et al modified by Greenberg et al teaches the packet communication network according to claim 4 as stated above and further Beshai et al modified by Greenberg et al teaches a gateway unit (part of an edge switch) that connects a specific edge-packet transfer unit (traffic from optical core) and an external network (local sources) (Beshai et al [10,62-67]), wherein the packet processing unit of the specific edge-packet transfer unit processes the packet output to the external-packet transmitting/receiving unit into the packet form (converts optical signal to an electrical form (Greenberg et al [10,47-55]) for the communication method corresponding to the service (IP router can determine if a message relates to the IP

protocol (Greenberg et al [10,63-67]) identified by the packet recognizing unit if the service is a service for connecting the specific edge-packet transfer unit and the external network, and the external-packet transmitting/receiving unit transmits the processed packet to the gateway unit corresponding to the external network (at ingress port external traffic is buffered according to destination (Beshai et al [10,62-67]).

Re claim 11, Beshai et al discloses the packet communication network according to claim 10 as stated above, but does not explicitly disclose wherein the internetwork connection unit includes an important communication processing unit, and the packet communication method further comprises: the important communication processing unit extracting and comparing important communication packets from the packets received from the first edge transfer units connected to the wavelength division multiplexing transmission units, respectively; and performing the redundant packet communication by copying, if there is a packet loss in one packet, other packet corresponding the one packet. However, Greenberg et al teaches of an important communication processing unit (unnamed), and the packet communication method further comprises: the important communication processing unit extracting and comparing important communication packets from the packets received from the first edge transfer units connected to the wavelength division multiplexing transmission units (nodes transmit relay and receive status information and commands and perform various diagnostics [7,36-50]), respectively; and performing the redundant packet communication by copying, if there is a packet loss in one packet, other packet corresponding the one packet ( nodes correct errors , for example if a laser fails, a

backup laser may be activated, and reroute information, thus a copy of the original packet [9, 10-27]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of wavelength division multiplexing in a network to copy a packet it there is a packet loss as taught by Greenberg et al in the method of Beshai et al in order to correct for packet loss.

Re claim 12, Beshai et al discloses the packet communication method according to claim 9 as stated above and further wherein the edge-packet transfer unit includes a packet processing unit (for example, edge switch takes traffic from ADM (optical node) and diverts it back to the core [6, 44-50]), but does not explicitly disclose performing a packet communication in which plural services are overlapped, by the packet processing unit processing the packet received from the external-packet transmitting/receiving unit into a packet form for a communication method used by the full-mesh wavelength-division-multiplexing transmission unit if a communication method corresponding to the service identified by the packet recognizing unit differs from the communication method used by the full-mesh wavelength-division-multiplexing transmission unit and processing the packet input from the full-mesh wavelength-division-multiplexing transmission unit to the internal-packet transmitting/receiving unit and output to the external-packet transmitting/receiving unit into the packet form for the communication method corresponding to the service identified by the packet recognizing unit if the communication method corresponding to the service differs from the communication method used by the full-mesh wavelength division multiplexing unit. However, Greenberg et al teaches of performing a packet communication, in

which plural services are overlapped (IP and optical), by the packet processing unit (OEC, Optical/electrical interface [10,7-17]) processing the packet received from the external-packet transmitting/receiving unit (IP router [10,7-17]) into a packet form for a communication method used by the full-mesh wavelength-division-multiplexing transmission unit if a communication method corresponding to the service identified by the packet recognizing unit differs from the communication method used by the full-mesh wavelength-division-multiplexing transmission unit (receives electrical signals from the IP router and converts the signals to optical form [10,47-55]), and processing the packet input from the full-mesh wavelength-division-multiplexing transmission unit (MDM – multiplexer / demultiplexer [10,7-17], which for example can include WDM signals [10,56-62]) to the internal-packet transmitting/receiving unit and output to the external-packet transmitting/receiving unit (IP router) into the packet form for the communication method (electrical signal) corresponding to the service identified by the packet recognizing unit (IP router can determine if a message relates to the IP protocol [10,63-67]) if the communication method corresponding to the service differs from the communication method used by the full-mesh wavelength division multiplexing unit (converts optical signal to an electrical form [10,47-55]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of wavelength division multiplexing in a network to include a packet processing unit as taught by Greenberg et al in the method of Beshai et al in order to transfer packets from one type of communication method to another communication method.

Re claim 13, note that Beshai et al modified by Greenberg et al teaches the packet communication method according to claim 12 as stated above and further Beshai et al modified by Greenberg et al teaches the method uses a gateway unit (part of an edge switch) that connects a specific edge-packet transfer unit (traffic from optical core) and an external network (local sources) (Beshai et al [10,62-67]), and the packet communication method further comprises: the packet processing unit of the specific edge-packet transfer unit processing the packet output to the external-packet transmitting/receiving unit into the packet form (converts optical signal to an electrical form (Greenberg et al [10,47-55]) for the communication method corresponding to the service (IP router can determine if a message relates to the IP protocol (Greenberg et al [10,63-67]) identified by the packet recognizing unit if the service is a service for connecting the specific edge-packet transfer unit and the external network; and the external-packet transmitting/receiving unit transmitting the processed packet to the gateway unit corresponding to the external network (at ingress port external traffic is buffered according to destination (Beshai et al [10,62-67]).

9. Claims 6-8, 14-16 rejected under 35 U.S.C. 103(a) as being unpatentable over Beshai et al in view of Drwiega et al (6,842,463).

Re claim 6, Beshai et al discloses the packet communication network according to claim 1 as stated above, but does not explicitly disclose wherein the edge-packet transfer unit includes a resource management unit that manages resource states of all of the wavelength paths related to an interface of each of the full-mesh wavelength-

division-multiplexing transmission units, the interface connecting the edge-packet transfer unit; and a resource-information transfer unit that transfers information on the resource states as a packet. However, Drwiega et al teaches of an edge-packet transfer unit (edge node) including a resource management unit (system 202 in Figure 2, also [4,65-67]) that manages resource states of all of the wavelength paths related to an interface of each of the full-mesh wavelength-division-multiplexing transmission units (optical paths in WDM [2,10-15]) (for example, path selector has access to information about topology, capacity of links, and capacity that tunnels use [6, 36-46]); and a resource-information transfer unit (system 202) that transfers information on the resource states as a packet (for example, tunnel signaler sends messages to all the nodes reserving the new capacity [7, 40-47]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of wavelength division multiplexing in a network to include a resource management unit as taught by Drwiega et al in the network of Beshai et al in order to control channel use effectively.

Re claim 7, note that Beshai et al modified by Drwiega et al teaches the packet communication network according to claim 6 as stated above, and further Drwiega et al teaches wherein when transmitting the packet input from the external-packet transmitting/receiving unit or the full-mesh wavelength division multiplexing unit , the destination of which identified by the packet recognizing unit is the other edge-packet transfer unit connected to the full-mesh wavelength-division-multiplexing transmission unit, to the wavelength path of the full-mesh wavelength-division-multiplexing transmission unit corresponding to the other edge-packet transfer unit, the

internal-packet transmitting/receiving unit of the edge-packet transfer unit transmits the packet to other wavelength path (alternate path [8,11-36]) if the resource state of the wavelength path is determined to be equal to or higher than a threshold (the increase request is refused and is forwarded to path selector[ 8,11-36]) based on resource state information (capacity of a given tunnel [7,55-65]) on the wavelength path managed by the resource management unit (capacity manager in system of 202). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of wavelength division multiplexing in a network to include transmitting packets on a different path as taught by Drwiega et al in the network of Beshai et al in order to avoid bottleneck links (Drwiega et al [8,11-14]).

Re claim 8, note that Beshai et al modified by Drwiega et al teaches the packet communication network according to claim 6 as stated above, and further Drwiega et al teaches wherein a communication for exercising a call admission control by transmitting a call control packet of a call request or a call response to a control server (system of 202, Figure 2) that includes a call-admission control unit (admission controller [5,46-60]) , the external-packet transmitting/receiving unit or the internal-packet transmitting/receiving unit of the edge-packet transfer unit adds resource state information (sends an indication of the available capacity to the originator of the request [5,46-60]) managed by the resource management unit (system of 202, Figure 2) to the call control packet (request) when a type of the packet identified by the packet recognizing unit is the call control packet (admission controller monitors traffic for requests [5,46-60]). It would have been obvious for one of ordinary skill in the art at the

time of the invention in the area of wavelength division multiplexing in a network to include call admission control as taught by Drwiega et al in the network of Beshai et al in order to control admission control requirements (Beshai et al [11,25-30]).

Re claim 14, Beshai et al discloses the packet communication network according to claim 9 as stated above, but does not explicitly disclose wherein the edge-packet transfer unit includes a resource management unit and a resource-information transfer unit, and the packet communication method further comprises: the resource management unit managing resource states of all of the wavelength paths related to the interfaces of each of the full-mesh wavelength-division-multiplexing transmission units to which interfaces the each edge-packet transfer unit is connected; and the resource-information transfer unit transferring information on each of the resource states as a packet. However, Drwiega et al teaches of an edge-packet transfer unit (edge node) including a resource management unit (system 202 in Figure 2, also [4,65-67]) and a resource-information transfer unit(system 202), and the packet communication method further comprises: the resource management unit managing resource states of all of the wavelength paths related to the interfaces (for example, path selector has access to information about topology, capacity of links, and capacity that tunnels use [6, 36-46]) of each of the full-mesh wavelength-division-multiplexing transmission units to which interfaces the each edge-packet transfer unit is connected (optical paths in WDM [2,10-15]); and the resource-information transfer unit transferring information on each of the resource states as a packet (for example, tunnel signaler sends messages to all the nodes reserving the new capacity [7, 40-47]). It would have been obvious for one of

ordinary skill in the art at the time of the invention in the area of wavelength division multiplexing in a network to include a resource management unit as taught by Drwiega et al in the method of Beshai et al in order to control channel use effectively.

Re claim 15, note that Beshai et al modified by Drwiega et al teaches the packet communication method according to claim 14 as stated above, and further Drwiega et al teaches the internal-packet transmitting/receiving unit of the edge-packet transfer unit transmitting, when transmitting the packet input from the external-packet transmitting/receiving unit or the full-mesh wavelength division multiplexing unit, the destination of which identified by the packet recognizing unit is the other edge-packet transfer unit connected to the full-mesh wavelength-division-multiplexing transmission unit, to the wavelength path of the full-mesh wavelength-division-multiplexing transmission unit corresponding to the other edge-packet transfer unit, the packet to other wavelength path (alternate path [8,11-36]) if the resource state of the wavelength path is determined to be equal to or higher than a threshold (the increase request is refused and is forwarded to path selector[ 8,11-36]) based on resource state information (capacity of a given tunnel [7,55-65]) on the wavelength path managed by the resource management unit (capacity manager in system of 202). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of wavelength division multiplexing in a network to include transmitting packets on a different path as taught by Drwiega et al in the method of Beshai et al in order to avoid bottleneck links (Drwiega et al [8,11-14]).

Re claim 16, note that Beshai et al modified by Drwiega et al teaches the packet communication method according to claim 14 as stated above, and further Drwiega et al teaches the external-packet transmitting/receiving unit or the internal-packet transmitting/receiving unit of the edge-packet transfer unit adding resource state information (sends an indication of the available capacity to the originator of the request [5,46-60]) managed by the resource management unit (system of 202, Figure 2) to a call control packet (request) when a type of the packet identified by the packet recognizing unit is the call control packet (admission controller monitors traffic for requests [5,46-60]), in a communication for exercising a call admission control by transmitting the call control packet of a call request or a call response to a control server that includes a call-admission control unit (admission controller [5,46-60]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of wavelength division multiplexing in a network to include call admission control as taught by Drwiega et al in the method of Beshai et al in order to control admission control requirements (Beshai et al [11,25-30]).

## *Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chan et al (5,351,146) is cited for containing a multi-level tree architecture in an optical environment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL FIALKOWSKI whose telephone number is (571)270-5425. The examiner can normally be reached on Monday - Friday 7:30am-5pm EST, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jinhee Lee can be reached on (571)272-1977. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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